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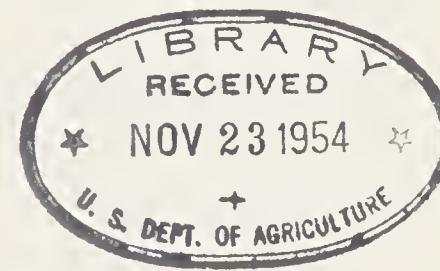
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RIGHT-OF-WAY TRIMMING

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- EXHIBITS A, B AND C



1. GENERAL

- 1.1 This section presents a discussion of tree trimming and brush removal for right-of-way maintenance.
- 1.2 Tree limbs and foliage in contact with open wire circuits create ground and shunt leakage which interferes with signalling and transmission. Tree limbs and foliage in contact with aerial cable or drop wires cause wear and eventual failure of the sheath or insulation. Any tree or foliage contact may cause service interruption. During the growing season presence of foliage, vine and moss contacts together with rain or dew on open wire circuits will adversely affect service and often cause complete service failures. Dead trees, which in falling or shedding limbs may damage the line, should be removed. Trimming is necessary when growth can contact cable or wires because of wind.
- 1.3 The use of machinery and chemicals to control brush require different techniques and may not be permitted under existing easements or right-of-way permits. They will be discussed in other sections of this manual.
- 1.4 Before undertaking trimming operations, written permission and trimming regulations should be obtained from the responsible civil authorities if the pole line is on public highways, streets or alleys, and from property owners if on private property. In any case it is desirable to consult with property owners and secure agreement on any proposed trimming.

2. SEASONAL TRIMMING

2.1 Trimming or pruning may be done in any season. More rapid healing will probably take place following late spring or early summer trimming. Fall and winter are favorable seasons for interference trimming because absence of foliage permits a better view of the branches. Also at this time of year property owners usually have more leisure and may cooperate in trimming their own trees and disposing of the wood and brush.

3. WORKING SAFELY

3.1 Do not use climbers when working in trees. Ladders and ropes are safer aids in climbing trees. One-half inch three strand rope has a good margin of safety.

3.2 Respect wires! Treat all wires as "hot". Remove overhanging limbs in such a manner as to prevent them falling on the wires and to avoid dragging them over the wires. Three-quarter inch rope is usually adequate for lowering heavy tree sections. Remove large limbs in sections.

3.3 When working along and over streets and highways use warning signs, properly placed, and prevent limbs from falling on the traveled way.

3.4 Use the proper tool. Sharp edged and pointed tools should be kept in guards or racks when not in use.

4. TRIMMING METHODS

4.1 The best trimming is that which leaves the tree most natural in appearance. There are four main types of trimming for clearance: (1) topping, (2) side trimming, (3) under trimming, and (4) through trimming. Proper shapes are illustrated in figures 1, 2, 3 and 4 of Exhibit A. Leave trees symmetrically shaped.

4.2 Cut off small branches at their meeting place with a limb that is growing in the direction you wish the tree to develop. In cutting a limb at a croetch, the cut should be parallel with the stem from which the limb has grown. It should be made as close as possible to the remaining branch in order that the bark may grow over the wound as quickly as possible. Undercut first to prevent stripping the bark. Do not leave stubs. The stub will die and be a starting place for decay and boring insects. Figures 5 and 6 of Exhibit A illustrate methods of cutting unwanted branches.

4.3 When removing a large limb, first undercut about one foot from where the finished cut is to be made. This will prevent splitting and tearing the wood and bark of the trunk. Next cut from above, and last, remove the stub. These steps are shown in Figure 7 of Exhibit A. When removing large overhanging limbs, it is advisable to rope the limb to a higher part of the tree so that in falling it will not drop into the wires.

- 4.4 Small pruning wounds callus over rapidly while large wounds sometimes require years. Asphaltic tree paint should be applied to cuts larger than one and one-half inches in diameter to prevent decay and entrance of insects. Large wounds will callus more quickly if the bark edge is painted with orange shellac and the wood portion painted with tree paint.
- 4.5 Vines on poles and anchors should be removed before they reach the wires. Tear the vines loose and lay them along the ground. If they are hacked off at the base of the pole or guy, the new growth will again follow the pole or guy.
- 4.6 Spanish moss and dead limbs laying on open wire will seriously affect service in damp and rainy weather and should be removed periodically. Removal can be accomplished with a lift pole, pike pole, or tree trimmer.

5. DIRECTIONAL TRIMMING

- 5.1 Top trimming must be repeated, usually each year. Directional trimming directs growth away from the wires and will usually prove more economical. Tree growth can be controlled and future trimming requirements reduced by directional trimming and cutting limbs at the proper spot. Figures 8 and 9 of Exhibit A illustrate methods of making cuts to control future growth. Exhibit B indicates tree species subject to successful directional trimming.

6. CLEARANCE

- 6.1 Clearance between limbs and foliage, and wires should be as great as practicable under local conditions. Wherever possible five years clearance should be obtained. Slow-growing trees require less cutting back than fast-growing trees. Exhibit B lists various species of trees, approximate annual growth, approximate mature height, direction of growth and notes on reaction to trimming. Average growth will vary considerably in different areas.
- 6.2 Generally trees should not be topped to obtain clearance for a cable or two-wire circuit, nor should a tree be mutilated to obtain additional clearance. If clearance cannot be obtained without mutilation, tree wire, side arms, tree guards, etc., should be considered.

7. BRUSH CONTROL

- 7.1 The mature height of many species of brush (tree and shrub types) is limited and savings in brush removal costs may be

realized if lower growing species are identified and left in place. For example, if the conductor ground clearance is 12 feet, shrubs maturing at 8 to 9 feet need not be removed. A more stable right-of-way also results, reducing future clearance costs. Exhibit C lists many species of low growing trees and shrubs with their average mature height. Mature height will vary considerably in different areas.

8. DISPOSAL OF DEBRIS

- 8.1 Disposal of logs, branches, foliage and brush must be accomplished to the complete satisfaction of the responsible civil authorities and the property owners. If trimming debris cannot be disposed of immediately, it should be piled neatly in inconspicuous locations.
- 8.2 If the debris is to be burned, burning permits are usually required. Brush should never be burned under wires or cables or near buildings.
- 8.3 Hauling costs can be kept at a minimum if an eroded gully can be located nearby. Land owners may desire such debris dumped into an eroding gully to slow erosion. Written permission for such disposal should be obtained.

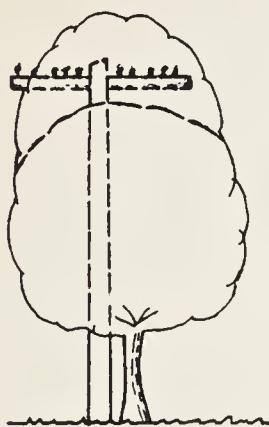


Figure 1
Top Trimming

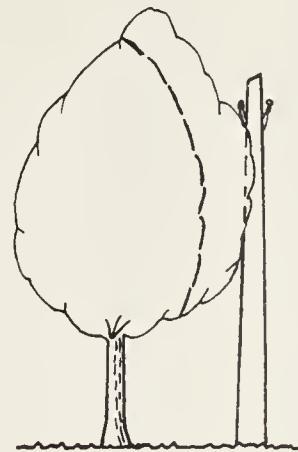


Figure 2
Side Trimming

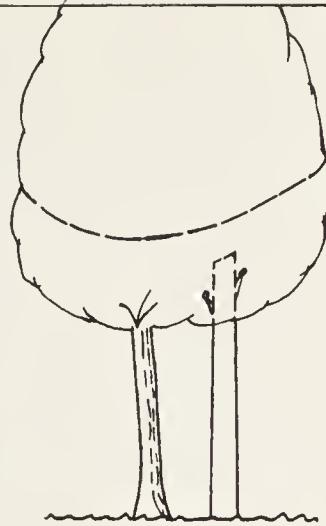


Figure 3
Under Trimming

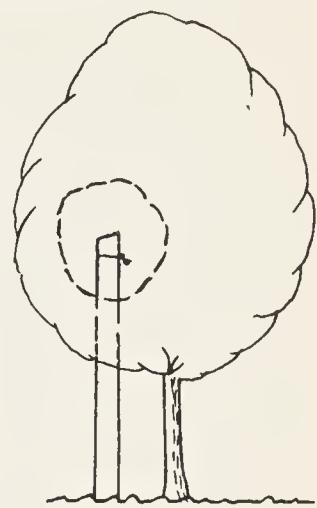


Figure 4
Through Trimming

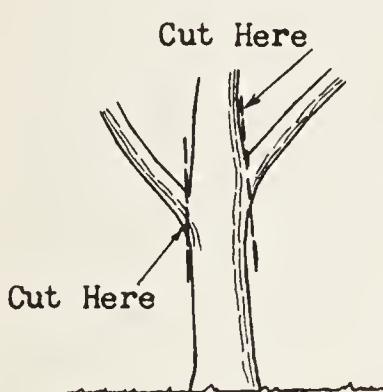


Figure 5
Cut limbs close to main stem. Leave no stubs

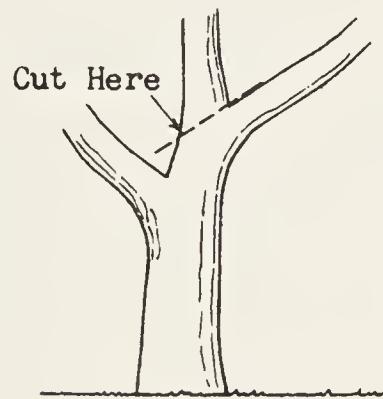


Figure 6
Always cut limbs to a live lateral branch

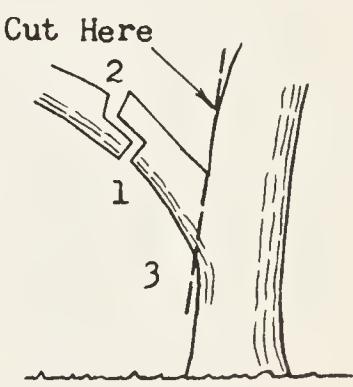


Figure 7
Three steps in cutting off a large limb

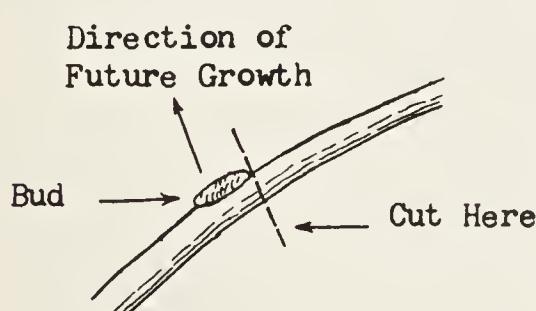


Figure 8

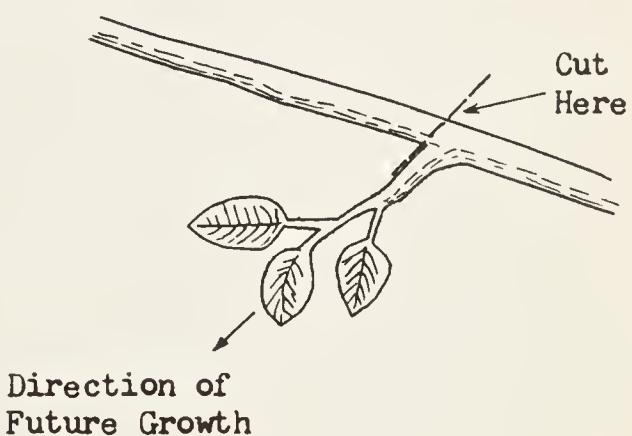


Figure 9

Proper Methods of Making Cuts in Growing Branches to Control Direction of Future Growth. When Pruning Branches Make Cut Ahead of Bud or Offshoot.

<u>Species</u>	<u>Approx. Annual Growth (ft.)</u>	<u>Approx. Sucker Growth (ft.)</u>	<u>Approx. Mature Height (ft.)</u>	<u>Remarks*</u>
<u>Upright Growing Trees</u>				
Ash	1.5	2.0	70	DT, NT
Cottonwood	4.0	9.0	75	B, NT, R
Elm	2.0	4.5	75	DT
Gum (Sweet)	1.0	-	90	DT
Gum (Blue)	2.0	-	115	UB, UT
Hickory	-	1.75	55	DT, NT
Kentucky Coffee Tree	1.0	-	70	DT, T
Locust (Honey)	1.5	2.75	70	DT
Magnolia	1.5	3.5	80	DT
Maple (Silver)	2.0	4.5	55	NT, SR
Oak (Laurel)	.5	-	70	DT
Oak (Pin)	2.0	2.5	90	DT, NT
Poplar	3.5	5.0	60	R, SR
Sycamore	1.5	4.75	90	DT, NT, SR
Tulip Tree	2.5	4.25	90	R
<u>Spreading Trees</u>				
Basswood	1.5	2.25	65	DT
Beech	1.0	-	50	DT, NT
Birch	2.0	4.25	40	NT, ST
Chestnut	1.0	1.5	60	DT, SG
Cherry	1.0	2.0	50	DT, NT
Hackberry	1.0	-	40	DT
Locust	1.5	5.5	70	NT, SG, SR
Maple (Red)	1.5	3.75	65	DT, NT, SR
Maple (Hard)	1.5	1.75	65	DT, NT
Oak (Live)	1.1	-	50	DT
Oak (Red)	1.5	2.5	75	DT
Oak (White)	.75	5.0	65	DT
Sycamore (London Plane)	1.5	4.5	65	DT
Walnut	1.0	1.5	70	DT, NT
<u>Horizontal Growing Trees</u>				
Aspen	1.25	2.25	40	B
Boxelder	2.0	4.75	40	B, R, SR
Dogwood	.5	-	25	SG
Maple (Norway)	1.0	1.5	40	DT, L
Osage Orange	1.5	3.0	35	R
Oak (Willow)	.75	-	40	DT, T
Willow (Black)	1.75	4.5	40	B

*Explanation of Symbols:

B = Brittle, breaks easily.
DT = Directional trimming O. K.
L = Low and compact.
NT = Not responsive to topping.
R = Remove if possible.
SG = Slow Growing.

SR = Suckers rapidly.
ST = Spoiled by trimming.
T = Responds to topping.
UB = Underbuild if possible.
UT = Undertrim.

BRUSH GROWTH (TREE AND SHRUB TYPES)

<u>Species</u>	<u>Approx. Mature Height (ft.)</u>	<u>Species</u>	<u>Approx. Mature Height (ft.)</u>
Alder	15	Hornbeam, European	15
Althea	8 - 10	Juniper	3 - 10
Arbor Vitae, American	15 - 20	Laburnum	10
Ash, Flowering	15	Laurel, Mountain	5 - 10
Ash, Golden Mountain	15 - 20	Locust, Black	20 - 30
Ash, Weeping	15	Locust, Golden	10 - 15
Barberry	4 - 6	Locust, Thornless	10 - 15
Beech, Cut-Leaved	20	Locust, Weeping Honey	15
Birch, Golden-Leaved	20	Magnolia	10 - 15
Box	5 - 10	Maple, Golden Japanese	10 - 15
Boxelder, Variegated	20	Maple, Golden Sycamore	20
Buckeye, Ohio	15 - 20	Maple, Japanese	10 - 15
Buckthorn	6 - 10	Maple, Mountain	15
Catalpa, Tea's	15	Maple, Tartarian	8 - 15
Cedar, Golden Red	10 - 15	Maple, Variegated Sycamore	20
Cedar, Silvery Red	15 - 20	Mulberry, Weeping	8 - 10
Cedar, Weeping Red	5 - 7	Orange, Osage	15 - 20
Chinquapin	10	Poplar, Golden-Leaved	20 - 30
Chokeberry	6 - 8	Poplar, Weeping	10 - 15
Crabapple	10 - 20	Shadbush, Common	10 - 15
Cranberry Bush	8	Sorrel Tree	10
Dogwood	6 - 8	Spice Bush	8 - 10
Elder	4 - 7	Spiraea	8 - 10
Elm, Weeping	10 - 15	Sumac	8 - 15
Fir, Cicilian	20	Syringa	5 - 12
Fir, Spanish	15 - 20	Thorn, Cockspur	12
Fir, Washington Blue	15 - 20	Thorn, Double White	15
Hawthorn, English	10	Thorn, Lavalle's	15
Hazel, Witch	8	Thorn, Paul's Double Scarlet	15
Holly, Mountain	6	Thorn, Scarlet	15
Honeysuckle	6 - 8	Thorn, Washington	10

